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WATER SUPPLY OUTLOOK
and
FEDERAL - STATE - PRIVATE COOPERATIVE SNOW SURVEYS
for
MONTANA

UNITED STATES DEPARTMENT of AGRICULTURE--SOIL CONSERVATION SERVICE,
and
MONTANA AGRICULTURAL EXPERIMENT STATION

Data included in this report were obtained by the agencies named above in cooperation with Federal, State, and private organizations listed on the inside back cover of this report.

AS OF
FEB. 1, 1964

UNITED STATES DEPARTMENT OF AGRICULTURE - SOIL CONSERVATION SERVICE

To Recipients of Water Supply Outlook Reports:

The climate of the cultivated and populated areas of the West is characterized by relatively dry summer months. Such precipitation as occurs falls mostly in the winter and early spring months when it is of little immediate benefit to growing crops. Most of this precipitation falls as mountain snow which stays on the ground for months, melting later to sustain streamflow during the period of greatest demand during late spring and summer. Thus, nature provides in mountain snow an imposing water storage facility.

The amount of water stored in mountain snow varies from place to place as well as from year to year and accordingly, so does the runoff of the streams. The best seasonal management of variable western water supplies results from advance estimates of the streamflow.

A snow survey consists of a series of about ten samples taken with specially designed snow sampling equipment along a permanently marked line, up to 1000 feet in length, called a snow course. The use of snow sampling equipment provides snow depth and water equivalent values for each sampling point. The average of these values is reported as the snow survey measurement for a snow course.

Snow surveys are made monthly or semi-monthly beginning in January or February and continue through the snow season until April, May or June. Currently more than 1400 western snow courses are measured each year. These measurements furnish the key data for water supply forecasts.

Streamflow forecasts are obtained by a comparison of total or maximum snow accumulation, as measured by snow water equivalent, to the subsequent spring and summer or snowmelt season runoff over a period of years. The snow water equivalent measured in selected snow courses provides most of the index to the streamflow forecast for the following season. More accurate forecasts are usually obtained when other factors such as soil moisture, base flow and spring precipitation are considered and included in the forecast procedure. Early season forecasts assume average climatic conditions through the snowmelt season.

Listed below are the Federal-State-Private Cooperative Snow Survey and Water Supply Forecast reports available for the West which contain detailed information on snow survey measurements, streamflow forecasts, reservoir storage, soil moisture and other guide data to water management and conservation decisions. Soil Conservation Service Reports may be secured from Water Supply Forecasting Unit, Soil Conservation Service, P.O. Box 2807, Portland, Oregon 97208.

PUBLISHED BY SOIL CONSERVATION SERVICE

<u>REPORTS</u>	<u>ISSUED</u>	<u>LOCATION</u>	<u>COOPERATING WITH</u>
RIVER BASINS			
WESTERN UNITED STATES _____	MONTHLY (FEB.-MAY) _____	PORTLAND, OREGON _____	ALL COOPERATORS
BASIC DATA SUMMARY _____	OCTOBER 1 _____	PORTLAND, OREGON _____	ALL COOPERATORS
STATES			
ALASKA _____	MONTHLY (MAR.-MAY) _____	PALMER, ALASKA _____	ALASKA S.C.D.
ARIZONA _____	SEMI-MONTHLY (JAN. 15 - APR. 1) _____	PHOENIX, ARIZONA _____	SALT R. VALLEY WATER USERS ASSOC. ARIZ. AGR. EXP. STATION
COLORADO AND NEW MEXICO _____	MONTHLY (FEB.-MAY) _____	FORT COLLINS, COLORADO _____	COLO. STATE UNIVERSITY COLO. STATE ENGINEER N. MEX. STATE ENGINEER
IDAHO _____	MONTHLY (JAN.-JUNE) _____	BOISE, IDAHO _____	IDAHO STATE RECLAMATION ENGINEER
MONTANA _____	MONTHLY (JAN.-JUNE) _____	BOZEMAN, MONTANA _____	MONT. AGR. EXP. STATION
NEVADA _____	MONTHLY (JAN.-MAY) _____	RENO, NEVADA _____	NEVADA DEPT. OF CONSERVATION AND NATURAL RESOURCES - DIVISION OF WATER RESOURCES
OREGON _____	MONTHLY (JAN.-JUNE) _____	PORTLAND, OREGON _____	OREG. STATE UNIVERSITY OREGON STATE ENGINEER
UTAH _____	MONTHLY (JAN.-JUNE) _____	SALT LAKE CITY, UTAH _____	UTAH STATE ENGINEER
WASHINGTON _____	MONTHLY (FEB.-JUNE) _____	SPOKANE, WASHINGTON _____	WN. STATE DEPT. OF CONSERVATION
WYOMING _____	MONTHLY (FEB.-JUNE) _____	CASPER, WYOMING _____	WYOMING STATE ENGINEER

PUBLISHED BY OTHER AGENCIES

<u>REPORTS</u>	<u>ISSUED</u>	<u>AGENCY</u>
BRITISH COLUMBIA _____	MONTHLY (FEB.-JUNE) _____	WATER RESOURCES SERVICE, DEPT. OF LANDS, FOREST AND WATER RESOURCES, PARLIAMENT BLDG., VICTORIA, B.C., CANADA
CALIFORNIA _____	MONTHLY (FEB.-MAY) _____	CALIF. DEPT. OF WATER RESOURCES, P.O. BOX 388, SACRAMENTO, CALIF.

WATER SUPPLY OUTLOOK
FEDERAL-STATE-PRIVATE COOPERATIVE SNOW SURVEYS
for
MONTANA

Report Prepared
By
Phillip E. Farnes
and
Stanley E. Cook

Snow Survey and Water Supply Forecasting Section
Soil Conservation Service
Box 855
Bozeman, Montana

Issued By

H. D. Hurd
State Conservationist
Soil Conservation Service
Bozeman, Montana

J. A. Asleson, Director
Montana Agricultural
Experiment Station
Bozeman, Montana

MONTANA
WATER SUPPLY OUTLOOK
as of
February 1, 1964

* * * * *

* The water supply outlook for the coming irrigation
* season has improved somewhat during the past month
* but remains below average. February 1 snow water
* content is almost double that which was measured
* on the January 1 surveys, and is generally 10 to
* 20 percent below average.

* Mountain soil moisture and storage in irrigation
* reservoirs are below average.

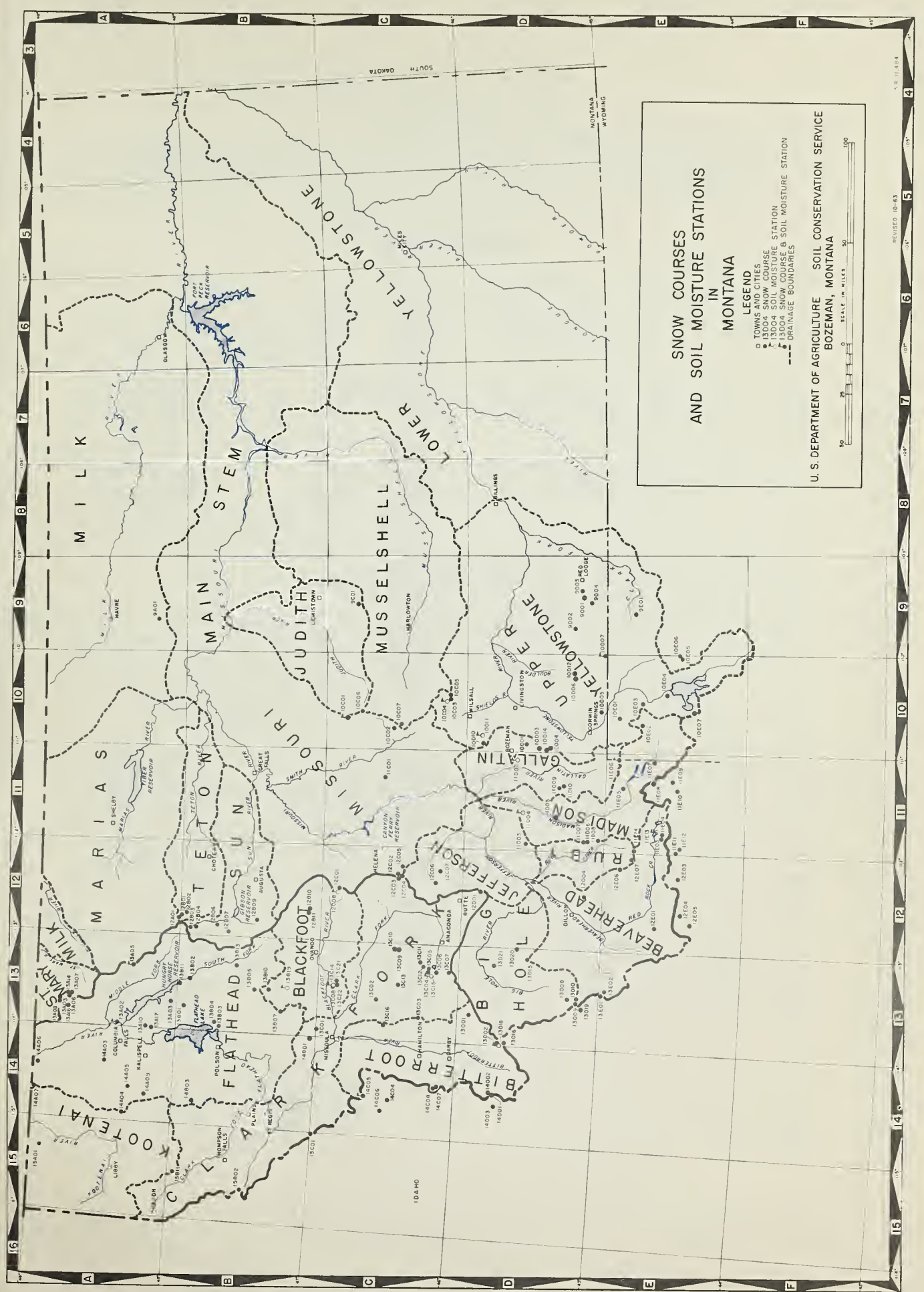
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West of the Continental Divide, streamflow during the spring and summer months should be adequate in most drainages of the state. The present outlook for the April through September streamflow is 5 to 15 percent below average, assuming near average precipitation in the mountains during the next few months.

East of the Continental Divide, streamflow should provide an adequate irrigation water supply except in the Milk and Marias River drainages in the northern portion of the state and in the Rock Creek and Red Lodge Creek drainages near Red Lodge in the southern portion of the state. If snow accumulation is below average during the next three months, shortages of irrigation water could occur on other Missouri and Yellowstone tributaries as mountain soil moisture and reservoir storage are generally below average.

Snow surveys made near the first of February in the Kootenai River basin in British Columbia indicate the mountain snow pack is 105 percent of last year and 78 percent of the 1943-57 average.

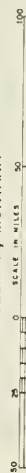
In the Flathead River drainage the snow pack shows a good increase and is now 50 percent more than last February 1 and 84 percent average.



SNOW COURSES
AND SOIL MOISTURE STATIONS
IN
MONTANA

- LEGEND
- TOWNS AND CITIES
 - 13004 SNOW COURSE
 - 13004 SOIL MOISTURE STATION
 - 13004 SNOW COURSE & SOIL MOISTURE STATION
 - DRAINAGE BOUNDARIES

U. S. DEPARTMENT OF AGRICULTURE
BOZEMAN, MONTANA



INDEX TO MONTANA SNOW COURSES AND SOIL MOISTURE STATIONS

SNOW COURSES

Drainage Basin & Course Name	Number	Elev.	Sec.	Twp.	Range	Record Began	Measuring Dates 1/	Meas. By 2/	Drainage Basin & Course Name	Number	Elev.	Sec.	Twp.	Range	Record Began	Measuring Dates 1/	Meas. By 2/									
COLUMBIA RIVER BASIN																										
KOOTENAI RIVER																										
Barco Creek	15811	5500	36	26N	31W	1956	3,4,5,5 ¹	2	Arch Falls	10014	7350	3	5S	6E	1963	2,3,4,5	1									
Brush Creek	12404	5000	12	30N	26W	1937	3,4,5	1,2	Bear Basin	11009	8150	9	6S	3E	1963	3,4,5	1									
Red Mountain	15401	6000	4	36N	29W	1937	3,4,5,5 ¹ ,6	1,2	Devil's Slide	10004	8100	14	5S	6E	1935	2,3,4,5, 6	1									
Weasel Divide	14007	5450	8	37N	24W	1937	3,4,5,5 ¹ ,6	1,2	Hood Meadow	10003	6600	22	4S	6E	1935	2,3,4,5	1									
FLATHEAD RIVER																										
Bassco Peak	14803	5150	11	24N	25W	1961	3,4,5	1,5	Little Park	11010	7400	22	6S	3E	1963	3,4,5	1									
Big Creek	13803	6750	7	22N	18W	1941	3,4,5, 6	1,5	New World	10001	6700	24	3S	6E	1939	2,3,4	1									
Camp Misery	13107	6400	30	28N	18W	1962	3,4,5, 5 ¹	1,2	Twenty-One Mile	11006	7150	1	11S	5E	1934	1,2,3,4,5	3									
Desert Mountain	13402	5600	24	31N	19W	1937	1,2,3,4,5, 6	1,2	MISSOURI RIVER MAIN STEM																	
Fatty Creek	13804	5500	4	22N	18W	1962	3,4,5, 6	1,5	Boulder Mountain	11001	7550	1	9N	3E	1963	3,4	1									
Griffin Creek Divide	14409	5150	11	28N	25W	1960	3,4,5	1,5	Chessman Reservoir	12005	6200	2	8N	5W	1936	1,2,3,4,5	3									
Hall Roaring Divide	14403	5770	35	32N	22W	1942	1,2,3,4,5,5 ¹ ,6	2	Crystal Lake	9001	6100	19	12N	18E	1941	3,4	1									
Holbrook	13813	4530	18	21N	13W	1951	2,3,4,5,5 ¹ ,6	1	Elk Peak	10007	8000	10	8N	8E	1963	3,4,5	1									
Kishbend	14406	3990	14	37N	22W	1954	3,4	6	Grasshopper	10008	7000	19	9N	8E	1938	3,4	1									
Legen Creek	14405	4300	34	30N	24W	1937	3,4,5	1,2	Kings Hill	10001	7500	34	13N	8E	1934	3,4,5	3									
Marlas Pass	13405	5250	34	30N	14W	1934	1,2,3,4,5	3	Rocky Boy	9401	5400	15	28N	16E	1941	3,4	7									
Mineral Creek	14406	4000	29	35N	17W	1937	3,4,5	6	Stangle Pass	12001	6900	16	13N	7W	1934	3,4,5	3									
North Fork Jocko	13807	6330	3	17N	17W	1941	3,4,5,5 ¹ ,6	1,5	Ten Mile Lower	12002	6250	13	8N	6W	1935	1,2,3,4,5	3									
Spotted Bear Mountain	13862	7000	23	25N	15W	1948	1,2,3,4,5	1,2	Ten Mile Middle	12003	6800	13	8N	6W	1934	1,2,3,4,5	3									
Strawberry Lake	13410	5600	11	28N	19W	1948	3,4,5	1	Ten Mile Upper	12004	8000	19	8N	5W	1935	1,2,3,4,5	3									
Trinkus Lake	13801	6500	9	25N	17W	1948	3,4,5	1	SUN-TETON-MARIAS RIVERS																	
Twin Creeks	13811	3580	24	26N	16W	1951	1,2,3,4,5	1,2	Cabin Creek	12806	5600	33	23N	10W	1949	3,4,5	1									
Upper Holland Lake	13805	7000	28	20N	15W	1948	3,4,5	1	Five-Bull	12809	5600	36	20N	10W	1948	3,4	1									
CLARK FORK RIVER																										
Black Pine	13013	7100	23	8N	15W	1959	3,4,5	1	Freight Creek	12401	6000	13	26N	10W	1948	3,4,5	1									
Copper Creek	12810	5700	1	15N	9W	1962	3,4,5	1,2	Gost Mountain	12807	7000	20	22N	10W	1934	3,4,5	3									
Cotton Mine	12811	6250	24	15N	9W	1962	3,4,5	1,2	Weldron Creek	12802	5600	16	25N	9W	1948	3,4,5	1									
Coyote Hill	13810	4200	12	18N	16W	1947	1,2,3,4,5	1,2	West Fork	12801	6000	6	25N	9W	1948	3,4,5	1									
El Dorado Mine	13009	7800	23	8N	12W	1949	3,4,5	1	Wrenge Creek	12804	5700	32	25N	10W	1949	3,4,5	1									
Fred Burr Pass	13011	8000	12	6N	13W	1957	3,4,5	1	Wrenge Ridge	12803	6800	17	25N	10W	1949	3,4,5	1									
Gold Creek Lake	13010	7200	14	8N	12W	1949	3,4	1	WYDING RIVER																	
Hoodoo Creek	15001	6200	9	14N	27W	1937	3,4,5	1,2	Spar Park	10006	8000	20	12N	9E	1963	3,4,5	1									
Interpurg	13004	6450	6	5N	13W	1936	2,3,4,5	4	UPPER YELLOWSTONE RIVER																	
Lubrecht Forest No. 3	13021	5450	19	13N	14W	1951	1,2,3,4,5	8	10005	7500	11	4N	10E	1961	3,4,5	1										
Lubrecht Forest No. 4	13022	4650	23	13N	15W	1951	1,2,3,4,5	8	9001	7890	2	8S	18E	1937	3,4,5	1										
Lubrecht Forest No. 6	13008	4040	11	13N	15W	1951	1,2,3,4,5	8	Crevin Mountain	10005	8400	22	9S	9E	1935	3,4	2									
Red Lion	13012	7100	22	6N	13W	1958	3,4,5	1	Grizzly Peak	9005	8400	26	7S	19E	1961	1,2,3,4,5	1									
Scakalajo Summit	13003	7260	30	6N	17W	1937	3,4,5,5 ¹ ,6	1	Independence	10006	8000	22	7S	12E	1940	3,4,5	1									
Slide Rock Mountain	13002	7100	35	10N	16W	1937	2,3,4,5	4	Monument Peak	10012	9000	22	7S	12E	1961	3,4,5	1									
Southern Cross	13005	6500	8	5N	13W	1936	2,3,4,5	4	Northeast Entrance	10007	7600	33	9S	14E	1937	1,2,3,4,5	6									
Stork Lake	13007	7780	19	4N	13W	1939	1,2,3,4,5,5 ¹ ,6	1	Percepine R. S.	10003	6500	10	4N	10E	1938	3,4,5	1									
Stuart Hill	13006	6500	19	5N	13W	1936	2,3,4	4	Taberline Creek	9004	8850	10	8S	18E	1961	3,4,5	1									
Stuart Mountain	13001	7400	6	14N	16W	1936	1,2,3,4,5,5 ¹ ,6	6	Sacajawea	10010	6550	36	2N	6E	1960	3,4	4									
TV Mountain	14001	6800	33	15N	19W	1956	1,2,3,4,5	8	West Rosebud	9002	7500	9	7S	16E	1960	3,4	4									
BITTERROOT RIVER																										
Ambrose	13016	6480	28	9N	18W	1960	3,4,5	1	SOIL MOISTURE STATIONS																	
East Fork R. S.	13001	5400	16	2N	17W	1937	3,4	1	COLUMBIA RIVER BASIN																	
Gibbons Pass	13002	7100	4	2S	19W	1934	1,2,3,4,5,5 ¹ ,6	1,3	FLATHEAD RIVER																	
Lost Horse	14007	5940	5	4N	23W	1960	3,4,5	1																		
Nes Perce Pass	14002	5580	19	1S	23W	1937	3,4,5	1	Desert Mountain	13402M	5600	24	31N	19W	1956	Monthly	1									
Nes Perce Pass	14001	6570	25	1S	24W	1937	3,4,5	1	Marlas Pass	13405M	5250	34	30N	14W	1950	Monthly	1									
Twin Lakes	12008	6510	32	5N	23W	1960	3,4,5	1	CLARK FORK RIVER																	
SASATCHAN RIVER BASIN																										
Iceberg Lake No. 3	13403	5600	1	35N	17W	1922	5	3,9	Georgetown Lake	13015M	6450	6	5N	13W	1962	Monthly	1									
Josephine Lower No. 9	13414	4900	22	35N	16W	1955	5	3,9	Lubrecht Forest	13014M	4100	11	13N	15W	1961	Monthly	8									
Mount Allen No. 7	13407	5700	27	35N	16W	1922	5	3,9	Seely Lake	13019M	4030	21	17N	15W	1963	Monthly	2									
Piegan Pass No. 6	13406	5500	27	35N	16W	1922	5	3,9	BITTERROOT RIVER																	
Flannigan No. 8	13408	5500	36	36N	17W	1937	5	3,9	Gibbons Pass	13018M	7100	4	2S	19W	1962	Monthly	1									
MISSOURI RIVER BASIN																		Lolo Pass	14005M	5250	11	10N	24W	1963	Monthly	1
BEAVERHEAD RIVER																		MISSOURI RIVER MAIN STEM								
Bloody Dick	13010	7600	12	8S	16W	1948	3,4,5	1	Stangle Pass	12008M	6250	16	13N	7W	1963	Monthly	1									
Carter Creek	12004	7400	22	8S	7W	1963	3,4	1	Kings Hill	10001M	7450	34	13N	8E	1963	Monthly	1									
Gold Stone	11009	8100	11	8S	16W	1948	3,4,5	1	YELLOWSTONE RIVER																	
Lakeview Canyon	11804	6930	26	14S	2W	1948	3,4,5	10	Battle Ridge	10011M	6020	32	2N	7E	1960	Monthly	1									
Lakeview Ridge	11803	7400	27	14S	2W	1948	3,4,5	10	Northeast Entrance	10007M	7350	33	9S	14E	1962	Monthly	6									
Leahli Pass	13001	7480	9	10S	15W	1948	3,4	1	Shields River	10004M	5950	4	4N	10E	1960	Monthly	1									
Trail Creek	12002	7990	15	10S	15W	1948	3,4,5	1	LEGEND																	
White Pine Ridge	12001	8850	18	14S	9W	1948	3,4,5	1	1. Soil Conservation Service	6. National Park Service	7. Montana Experiment Station	8. Montana State Forestry School	9. Dominion Water & Power Bureau	10. Bureau of Sport Fisheries & Wildlife												
NOSE RIVER																		2. U. S. Forest Service								
Clover Meadow	11008	8600	28	9S	2W	1963	3,4,5	1	3. U. S. Geological Survey																	
Divide	12007	7900	14	12S	4W	1963	3,4,5	1	4. Montana Power Company																	
Notch	12006	8500	18	11S	4W	1963	3,4,5	1	5. U. S. Indian Service																	
BIG HOLE RIVER																		M - Soil Moisture								
Abundance Lake	13020	8800	7	3S	11W	1963	3,4,5	1	M - Soil Moisture																	
Darkhorse Lake	13019	8600	4	8S	16W	1963	3,4,5	1																		
Elk Horn Springs	13015	7800	21	4S	12W	1935	3,4,5	3																		
Foolhook	13021	8500	11	4S	12W	1963	3,4,5	3																		
Jahnke Creek	13008	7340	25	7S	16W	1948	3,4,5	1																		
JEFFERSON RIVER																										
Berry Meadow	12007	7300	17	5N	5W	1962	3,4,5	1																		
Picnic Grounds	12006	6500	10	5N	6W	1941	2,3,4	4																		
Pipetstone Pass	12001	7200	10	1N	7W	1938	1,2,3,4,5	1																		
MADISON RIVER																										
Call Road	11007	8050	21	8S	2W	1962	3,4,5	1																		
Crockett Lake	11006	8400	20	8S	2W	1962	3,4,5	1																		
Hegen Dam	11005	6500	22	11S	3E	1934	1,2,3,4,5	3																		
Jack Creek	11005	6800	13	6S	1E	1961	3,4	1																		
North Meadow	11003	7500	23	8S	2W	1961	3,4,5	3																		
West Yellowstone	11007	6700	34	13S	5E	1934	1,2,3,4,5	3																		

SOIL MOISTURE DATA

AS OF FEBRUARY 1, 1964

(Inches)

SOIL MOISTURE STATION			SOIL PROFILE		CURRENT DATA		PAST RECORD	
NO.	NAME	ELEVATION	DEPTH	FIELD CAPACITY	DATE OF SURVEY	SOIL MOISTURE	LAST YEAR	**AVERAGE

COLUMBIA RIVER BASIN

<u>Flathead</u>								
13A02M	Desert Mountain	5600	54	8.4	1/31	5.8	7.2	7.0
13A05M	Marias Pass	5250	54	6.5	1/28	4.4	5.3	5.0

<u>Clark Fork</u>								
13C15M	Georgetown Lake	6450	48	8.3	1/27	2.4	3.2	-
13B19M	Seeley Lake	4030	48	10.6	1/31	1.6	-	-

<u>Bitterroot</u>								
13D18M	Gibbons Pass	7100	48	7.1	1/29	5.5	5.8	-
14C05M	Lolo Pass	5250	48	8.5	1/28	5.2	-	-

MISSOURI RIVER BASIN

<u>Beaverhead</u>								
11E13M	Lakeview	6700	48	15.3	1/31	8.3	5.4	-

<u>Madison</u>								
10D04M	Red Bluff	4800	40	4.7	1/30	1.5	2.7	-

<u>Gallatin</u>								
11D02M	College Site	4856	54	14.5	1/31	6.8	12.5	9.0
11E06M	Twenty-One Mile	7150	48	8.8	1/28	3.8	-	-

<u>Missouri Main Stem</u>								
10C01M	Kings Hill	7420	48	11.8	1/31	7.7	-	-
12C08M	Stemple Pass	6350	48	5.9	1/30	3.9	-	-

<u>Yellowstone</u>								
10D11M	Battle Ridge	6020	48	15.4	1/31	9.3	13.8	-
10D07M	Northeast Entrance	7350	48	9.4	1/31	7.9	7.2	-
10C04M	Shields River	5850	48	17.8	1/31	8.9	10.0	-

SNOW SURVEY DATA

AS OF FEBRUARY 1, 1964

(inches)

SNOW COURSE			CURRENT DATA			PAST RECORD	
NO.	NAME	ELEVATION	DATE OF SURVEY	SNOW DEPTH	WATER CONTENT	WATER CONTENT	
						LAST YEAR	AVERAGE

COLUMBIA RIVER BASIN

KOOTENAI RIVER

BC 10	Fernie	3500	1/31	34	4.5	2.2	7.3
BC 12A	Field	4200	1/31	20	4.1	3.8	4.5
BC 43	Gray Creek	5100	1/29	47	11.6	10.6	12.5*
BC 33	Kicking Horse	5400	1/31	40	9.7	10.3	10.9*
BC 20B	Kimberley	3800				-	6.2*
BC 32	Marble Canyon	5000	1/31	33	8.8	8.0	11.1*
BC 10B	Morrissey Ridge	6100				15.8	-
BC 10A	New Fernie	4100	1/31	47	5.4	6.3	11.1*
BC 8A	Sinclair Pass	4500	1/31	20	3.8	3.3	4.7*
BC 20A	Sullivan Mine	5100	1/31	36	8.2	8.8	9.6*

FLATHEAD RIVER

13A02	Desert Mountain	5600	1/31	39	10.8	6.7	10.8*
14A03	Hell Roaring Divide	5770	1/28	68	20.2	-	-
13B13	Holbrook	4530	1/29	33	6.2	4.7	7.5*
13A05	Marias Pass	5250	1/28	44	10.2	7.3	13.0
13B02	Spotted Bear Mt.	7000	1/29	37	7.4	6.4	11.0*
13B11	Twin Creeks	3580	1/29	36	8.6	3.8	8.8*

CLARK FORK RIVER

13B10	Coyote Hill	4200	1/31	31	6.7	5.0	8.0*
13C04	Intergaard	6450	1/31	23	4.9	5.6	4.9*
15B02	Lookout	5250	1/30	97	26.7	14.5	25.8*
13C21	Lubrecht Forest No. 3	5450	1/26	38	8.6	3.8	3.9*
13C22	Lubrecht Forest No. 4	4650	1/26	21	4.0	2.6	2.1*
13C08	Lubrecht Forest No. 6	4040	1/26	25	4.3	3.4	2.6*
13C05	Southern Cross	6500	1/31	18	4.1	5.0	3.8*
13C18	Spring Gulch	6000	2/1	38	9.0	8.4	-
13C07	Storm Lake	7780	1/28	34	7.0	10.6	8.8*
13C06	Stuart Mill	6500	1/31	22	4.8	5.1	4.3*
13C01	Stuart Mountain	7400	2/1	74	22.1	17.6	22.2*
14B01	TV Mountain	6800	1/26	47	10.6	11.0	11.2*

BITTERROOT RIVER

13D02	Gibbons Pass	7100	1/29	67	16.8	10.8	16.4*
13D16	Moose Creek	6200	1/28	59	14.0	5.7	12.2*

ATAS Y3V7R2 W0M2

2011-12-20 10:00 AM

Station	Time	Frequency	Power	Antenna	Notes
ATAS	10:00	10.0	100	100	100

Table 1: Data

Table 1: Data

Station	Time	Frequency	Power	Antenna	Notes
ATAS	10:00	10.0	100	100	100
ATAS	10:01	10.0	100	100	100
ATAS	10:02	10.0	100	100	100
ATAS	10:03	10.0	100	100	100
ATAS	10:04	10.0	100	100	100
ATAS	10:05	10.0	100	100	100
ATAS	10:06	10.0	100	100	100
ATAS	10:07	10.0	100	100	100
ATAS	10:08	10.0	100	100	100
ATAS	10:09	10.0	100	100	100

Table 1: Data

Station	Time	Frequency	Power	Antenna	Notes
ATAS	10:00	10.0	100	100	100
ATAS	10:01	10.0	100	100	100
ATAS	10:02	10.0	100	100	100
ATAS	10:03	10.0	100	100	100
ATAS	10:04	10.0	100	100	100
ATAS	10:05	10.0	100	100	100
ATAS	10:06	10.0	100	100	100
ATAS	10:07	10.0	100	100	100
ATAS	10:08	10.0	100	100	100
ATAS	10:09	10.0	100	100	100

Table 1: Data

Station	Time	Frequency	Power	Antenna	Notes
ATAS	10:00	10.0	100	100	100
ATAS	10:01	10.0	100	100	100
ATAS	10:02	10.0	100	100	100
ATAS	10:03	10.0	100	100	100
ATAS	10:04	10.0	100	100	100
ATAS	10:05	10.0	100	100	100
ATAS	10:06	10.0	100	100	100
ATAS	10:07	10.0	100	100	100
ATAS	10:08	10.0	100	100	100
ATAS	10:09	10.0	100	100	100

Table 1: Data

Station	Time	Frequency	Power	Antenna	Notes
ATAS	10:00	10.0	100	100	100
ATAS	10:01	10.0	100	100	100
ATAS	10:02	10.0	100	100	100
ATAS	10:03	10.0	100	100	100
ATAS	10:04	10.0	100	100	100
ATAS	10:05	10.0	100	100	100
ATAS	10:06	10.0	100	100	100
ATAS	10:07	10.0	100	100	100
ATAS	10:08	10.0	100	100	100
ATAS	10:09	10.0	100	100	100

SNOW SURVEY DATA

AS OF FEBRUARY 1, 1964

(inches)

SNOW COURSE			CURRENT DATA			PAST RECORD	
NO.	NAME	ELEVATION	DATE OF SURVEY	SNOW DEPTH	WATER CONTENT	WATER CONTENT	
						LAST YEAR	AVERAGE

MISSOURI RIVER BASIN

BEAVERHEAD RIVER

12E03	Camp Creek	6800	1/28	25	5.0	2.9	7.0
11E12	Kilgore	6200	1/28	28	6.0	3.1	7.2

JEFFERSON RIVER

12C06	Picnic Grounds	6500	1/31	15	3.0	3.5	3.7*
12D01	Pipestone Pass	7200	1/27	15	3.2	5.4	3.2*

MADISON RIVER

11E09	Big Springs	6500	1/28	49	11.4	6.2	14.5
11E05	Hebgen Dam	6550	1/30	34	7.2	5.3	8.6
11E10	Island Park	6315	1/28	42	8.7	4.9	11.3
10E02	Norris Basin	7500	1/30	36	8.5	7.3	7.1*
11E08	Valley View	6500	1/28	45	11.5	7.6	10.9*
11E07	West Yellowstone	6700	1/30	32	6.8	3.8	8.8

GALLATIN RIVER

10D14	Arch Falls	7350	2/1	28	6.4	-	-
10D04	Devil's Slide	8100	2/1	48	11.9	14.6	11.9*
10D03	Hood Meadow	6600	1/31	21	4.6	8.7	5.1*
10D01	New World	6700	1/30	29	6.2	8.4	6.3*
11E06	Twenty-One Mile	7150	1/29	48	11.0	6.4	13.0

MISSOURI RIVER (Main Stem)

12C05	Chessman Reservoir	6200	No measurement			3.8	3.4
12C02	Tenmile Lower	6250	2/4	22	5.4	5.1	5.1
13C03	Tenmile Middle	6800	2/4	31	7.8	7.1	7.4
12C04	Tenmile Upper	8000	2/4	38	10.4	9.7	9.4

UPPER YELLOWSTONE RIVER

10E03	Canyon	7750	1/30	42	10.0	7.2	10.4*
10E06	East Entrance	7000	1/31	31	6.8	6.7	8.1*
9D05	Grizzly Peak	8400	1/30	19	4.1	10.3	-
10E04	Lake Camp No. 2	7850	1/30	30	4.4	3.0	7.4*
9E01	Lodgepole	8200	1/30	32	6.7	6.6	8.3*
10E01	Lupine Creek	7300	1/31	28	6.0	5.4	7.1*
10D07	Northeast Entrance	7400	1/31	24	5.4	6.0	6.0*
10E05	Sylvan Pass	7100	1/31	38	8.8	5.6	10.2*
10E07	Thumb Divide	7900	1/29	49	11.8	8.6	15.9*

RESERVOIR STORAGE DATA

AS OF JANUARY 31, 1964

(1000 Acre Feet)

			USEABLE STORAGE			
BASIN	RESERVOIR	USEABLE CAPACITY	THIS YEAR	LAST YEAR	AVERAGE	
COLUMBIA RIVER BASIN						
Flathead	Hungry Horse	3,428.0	2,450.0	2,775.0	2,620.0**	
	Flathead Lake	1,791.0	1,591.0	1,399.0	991.7	
	Camas 1/	45.2	17.9	26.7	23.6	
	Mission Valley 2/	100.3	18.9	27.3	31.6	
Clark Fork	Georgetown Lake	31.0	28.9	26.2	24.0	
	Noxon	334.6	-	311.1	-	
Bitterroot	Como	34.9	5.3	17.1	10.4	
	Painted Rocks	31.7	22.8	-	10.1**	
MISSOURI RIVER BASIN						
Beaverhead	Lima	84.0	-	24.5	32.8	
Ruby	Ruby	38.8	-	18.5	25.8**	
Madison	Hebgen Lake	384.8	211.3	233.6	223.3	
	Ennis Lake	41.0	39.2	39.1	35.7	
Gallatin	Middle Creek	8.0	2.9	4.3	3.4**	
Missouri	Canyon Ferry	2,043.0	1,732.0	1,951.0	1,612.0**	
	Hauser & Helena	61.9	48.9	48.4	49.3	
	Lake Helena	10.4	6.0	5.9	7.1**	
	Holter Lake	81.9	56.9	34.0	62.1	
	Smith River	10.7	7.4	7.2	5.2**	
	Ackley Lake	5.8	-	3.8	3.9	
	Durand	7.0	3.9	5.4	4.6	
	Martinsdale	23.1	8.2	8.6	9.5	
	Deadman's Basin	72.2	48.2	47.4	48.6**	
	Fort Peck	19,410.0	11,720.0	9,878.0	11,030.0	
	Sun-Teton	Gibson	105.0	16.4	37.3	59.9
		Willow Creek	32.3	21.0	25.5	18.7
		Pishkun	32.0	17.5	18.4	19.3
	Marias	Lower Two Medicine	16.6	-	-	0
		Four Horns	19.2	-	-	8.4
Swift		30.0	10.3	10.1	20.9	
Lake Francis		112.0	33.2	65.0	88.4	
Tiber		1,313.0	642.3	628.1	629.5**	
Milk	Fresno	127.2	39.8	33.1	64.0	
	Nelson	66.8	33.2	45.9	35.6	
	Lake Sherburne	66.1	16.0	-	18.7	
Yellowstone	Mystic Lake	20.8	11.2	11.1	11.3	
	Tongue River	68.0	40.7	30.9	7.4	
	Cooney	27.5	-	14.9	9.1	

1/ Sum of four small reservoirs on west side of Flathead Lake.

2/ Sum of eight small reservoirs in Mission Valley not including Jocko Lake.

- 7 -

NOTE: ALL AVERAGES BASED ON 1943-1957 (15 YEAR PERIOD).

**AVERAGE FOR PERIOD OF RECORD

THE UNIVERSITY OF CHICAGO LIBRARY

Author		Title		Date	
A. B. C.		1. The first book		1890	
D. E. F.		2. The second book		1891	
G. H. I.		3. The third book		1892	
J. K. L.		4. The fourth book		1893	
M. N. O.		5. The fifth book		1894	
P. Q. R.		6. The sixth book		1895	
S. T. U.		7. The seventh book		1896	
V. W. X.		8. The eighth book		1897	
Y. Z. A.		9. The ninth book		1898	
B. C. D.		10. The tenth book		1899	
E. F. G.		11. The eleventh book		1900	
H. I. J.		12. The twelfth book		1901	
K. L. M.		13. The thirteenth book		1902	
N. O. P.		14. The fourteenth book		1903	
Q. R. S.		15. The fifteenth book		1904	
T. U. V.		16. The sixteenth book		1905	
W. X. Y.		17. The seventeenth book		1906	
Z. A. B.		18. The eighteenth book		1907	
C. D. E.		19. The nineteenth book		1908	
F. G. H.		20. The twentieth book		1909	
I. J. K.		21. The twenty-first book		1910	
L. M. N.		22. The twenty-second book		1911	
O. P. Q.		23. The twenty-third book		1912	
R. S. T.		24. The twenty-fourth book		1913	
U. V. W.		25. The twenty-fifth book		1914	
X. Y. Z.		26. The twenty-sixth book		1915	
A. B. C.		27. The twenty-seventh book		1916	
D. E. F.		28. The twenty-eighth book		1917	
G. H. I.		29. The twenty-ninth book		1918	
J. K. L.		30. The thirtieth book		1919	
M. N. O.		31. The thirty-first book		1920	
P. Q. R.		32. The thirty-second book		1921	
S. T. U.		33. The thirty-third book		1922	
V. W. X.		34. The thirty-fourth book		1923	
Y. Z. A.		35. The thirty-fifth book		1924	
B. C. D.		36. The thirty-sixth book		1925	
E. F. G.		37. The thirty-seventh book		1926	
H. I. J.		38. The thirty-eighth book		1927	
K. L. M.		39. The thirty-ninth book		1928	
N. O. P.		40. The fortieth book		1929	
Q. R. S.		41. The forty-first book		1930	
T. U. V.		42. The forty-second book		1931	
W. X. Y.		43. The forty-third book		1932	
Z. A. B.		44. The forty-fourth book		1933	
C. D. E.		45. The forty-fifth book		1934	
F. G. H.		46. The forty-sixth book		1935	
I. J. K.		47. The forty-seventh book		1936	
L. M. N.		48. The forty-eighth book		1937	
O. P. Q.		49. The forty-ninth book		1938	
R. S. T.		50. The fiftieth book		1939	
U. V. W.		51. The fifty-first book		1940	
X. Y. Z.		52. The fifty-second book		1941	
A. B. C.		53. The fifty-third book		1942	
D. E. F.		54. The fifty-fourth book		1943	
G. H. I.		55. The fifty-fifth book		1944	
J. K. L.		56. The fifty-sixth book		1945	
M. N. O.		57. The fifty-seventh book		1946	
P. Q. R.		58. The fifty-eighth book		1947	
S. T. U.		59. The fifty-ninth book		1948	
V. W. X.		60. The sixtieth book		1949	
Y. Z. A.		61. The sixty-first book		1950	
B. C. D.		62. The sixty-second book		1951	
E. F. G.		63. The sixty-third book		1952	
H. I. J.		64. The sixty-fourth book		1953	
K. L. M.		65. The sixty-fifth book		1954	
N. O. P.		66. The sixty-sixth book		1955	
Q. R. S.		67. The sixty-seventh book		1956	
T. U. V.		68. The sixty-eighth book		1957	
W. X. Y.		69. The sixty-ninth book		1958	
Z. A. B.		70. The seventieth book		1959	
C. D. E.		71. The seventy-first book		1960	
F. G. H.		72. The seventy-second book		1961	
I. J. K.		73. The seventy-third book		1962	
L. M. N.		74. The seventy-fourth book		1963	
O. P. Q.		75. The seventy-fifth book		1964	
R. S. T.		76. The seventy-sixth book		1965	
U. V. W.		77. The seventy-seventh book		1966	
X. Y. Z.		78. The seventy-eighth book		1967	
A. B. C.		79. The seventy-ninth book		1968	
D. E. F.		80. The eightieth book		1969	
G. H. I.		81. The eighty-first book		1970	
J. K. L.		82. The eighty-second book		1971	
M. N. O.		83. The eighty-third book		1972	
P. Q. R.		84. The eighty-fourth book		1973	
S. T. U.		85. The eighty-fifth book		1974	
V. W. X.		86. The eighty-sixth book		1975	
Y. Z. A.		87. The eighty-seventh book		1976	
B. C. D.		88. The eighty-eighth book		1977	
E. F. G.		89. The eighty-ninth book		1978	
H. I. J.		90. The ninetieth book		1979	
K. L. M.		91. The ninety-first book		1980	
N. O. P.		92. The ninety-second book		1981	
Q. R. S.		93. The ninety-third book		1982	
T. U. V.		94. The ninety-fourth book		1983	
W. X. Y.		95. The ninety-fifth book		1984	
Z. A. B.		96. The ninety-sixth book		1985	
C. D. E.		97. The ninety-seventh book		1986	
F. G. H.		98. The ninety-eighth book		1987	
I. J. K.		99. The ninety-ninth book		1988	
L. M. N.		100. The hundredth book		1989	

Agencies Cooperating in Collecting Data Contained
in this Bulletin

U. S. Forest Service
Region 1, Missoula, Montana

U. S. Geological Survey
Helena, Montana

U. S. Army Corps of Engineers
Portland, Oregon
Seattle, Washington
Omaha, Nebraska
Riverdale, N. D.

U. S. Indian Irrigation Service
St. Ignatius, Montana

U. S. Weather Bureau
Helena, Montana

U. S. Bureau of Sports Fisheries
and Wildlife
Red Rock Lakes Refuge
Monida, Montana

U. S. Bureau of Reclamation
Billings, Montana
Boise, Idaho

Montana Power Company
Butte, Montana

Agricultural Experiment Station
North Montana Branch Station
Havre, Montana

Agricultural Experiment Station
North Montana Branch Station
Havre, Montana

National Park Service
Yellowstone National Park
Glacier National Park

Montana Experiment Station
Montana State College
Bozeman, Montana

Bonneville Power Administration
Portland, Oregon

Montana State University
School of Forestry
Missoula, Montana

Soil Conservation Service
Montana, Wyoming, Idaho

Soil Conservation Districts
Montana Counties

Johnson Flying Service, Inc.
Missoula, Montana

Water Rights Branch, Dept.
of Lands and Forests
Victoria, British Columbia

Department of Northern Affairs
and National Resources
Calgary, Alberta

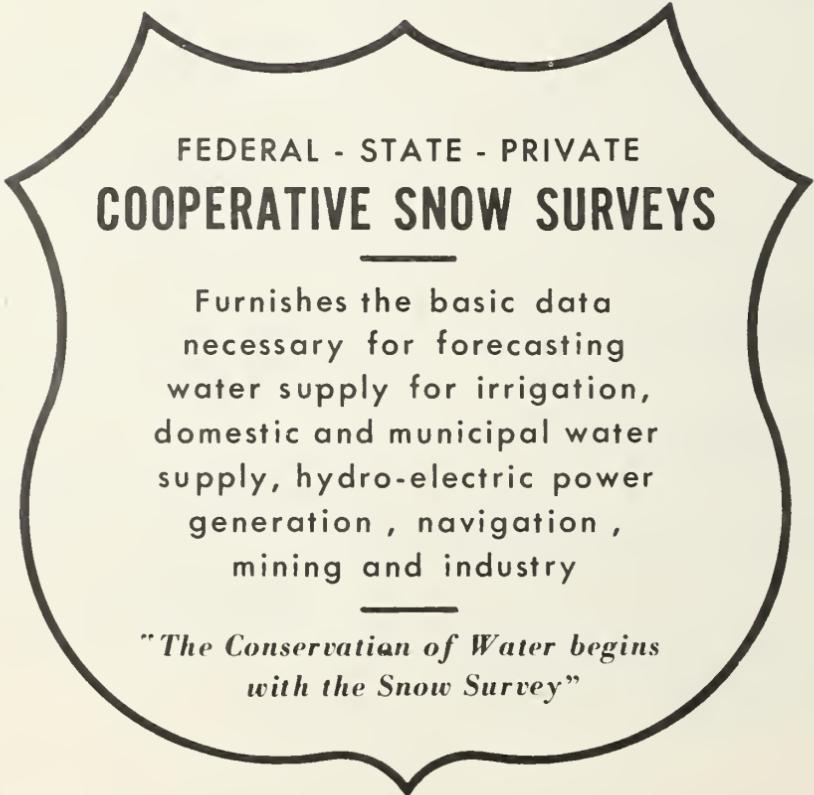
State Engineer
Montana and Wyoming

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FEDERAL - STATE - PRIVATE
COOPERATIVE SNOW SURVEYS

Furnishes the basic data
necessary for forecasting
water supply for irrigation,
domestic and municipal water
supply, hydro-electric power
generation, navigation,
mining and industry

*"The Conservation of Water begins
with the Snow Survey"*